Alternative Delta Conveyance as part of a comprehensive Bay-Delta Conservation Plan

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California Wetlands Conference

August 23, 2007

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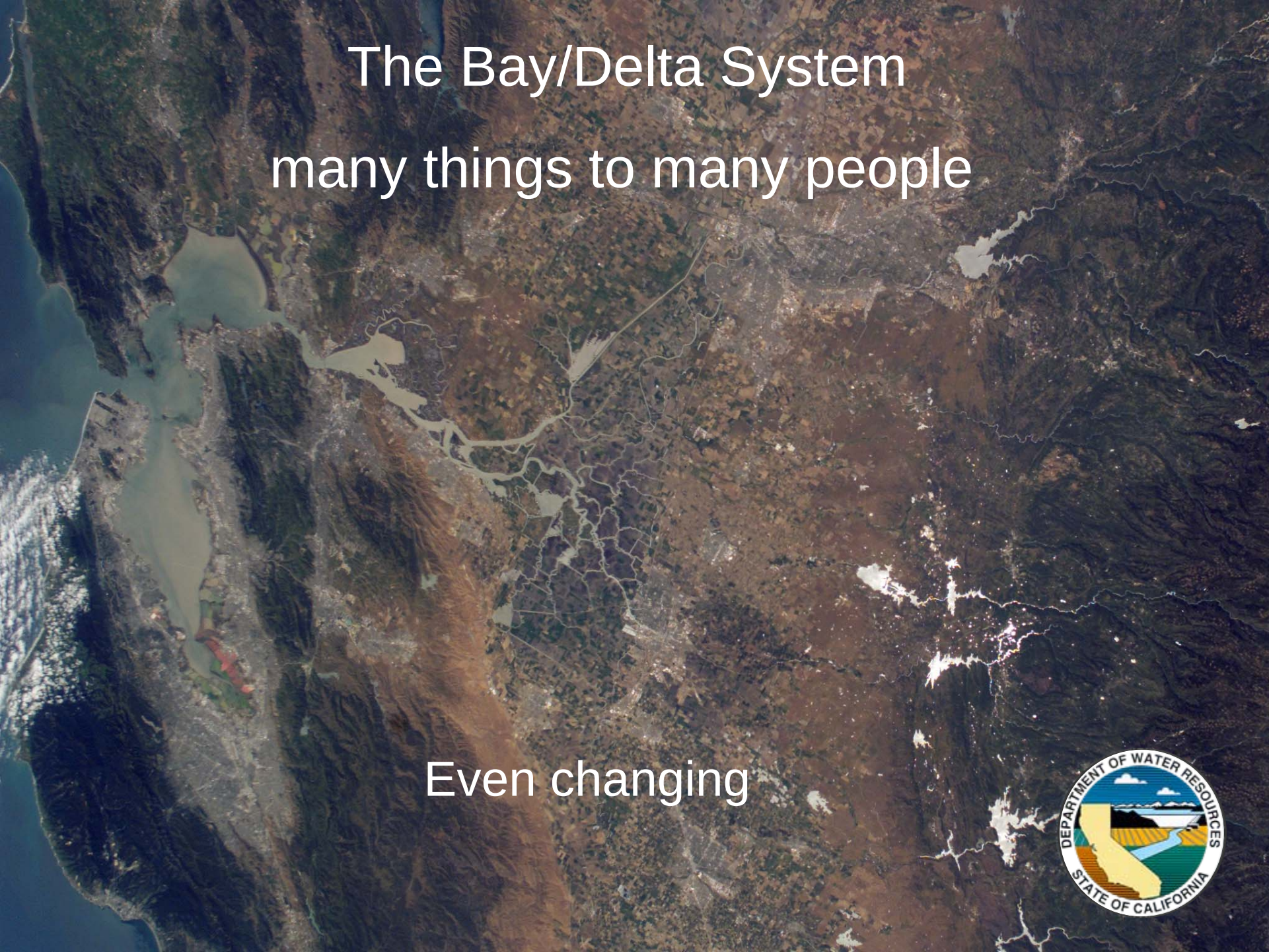
Deputy Director
Department of Water Resources

California Water Systems


The Bay/Delta System
many things to many people
Even changing
DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

Threats to Delta Uses

- Seismic issues
- Sea Level rise
- Subsidence
- Random levee failure
- Drinking water quality concerns
- Fishery concerns and water supply reliability - focus of this presentation

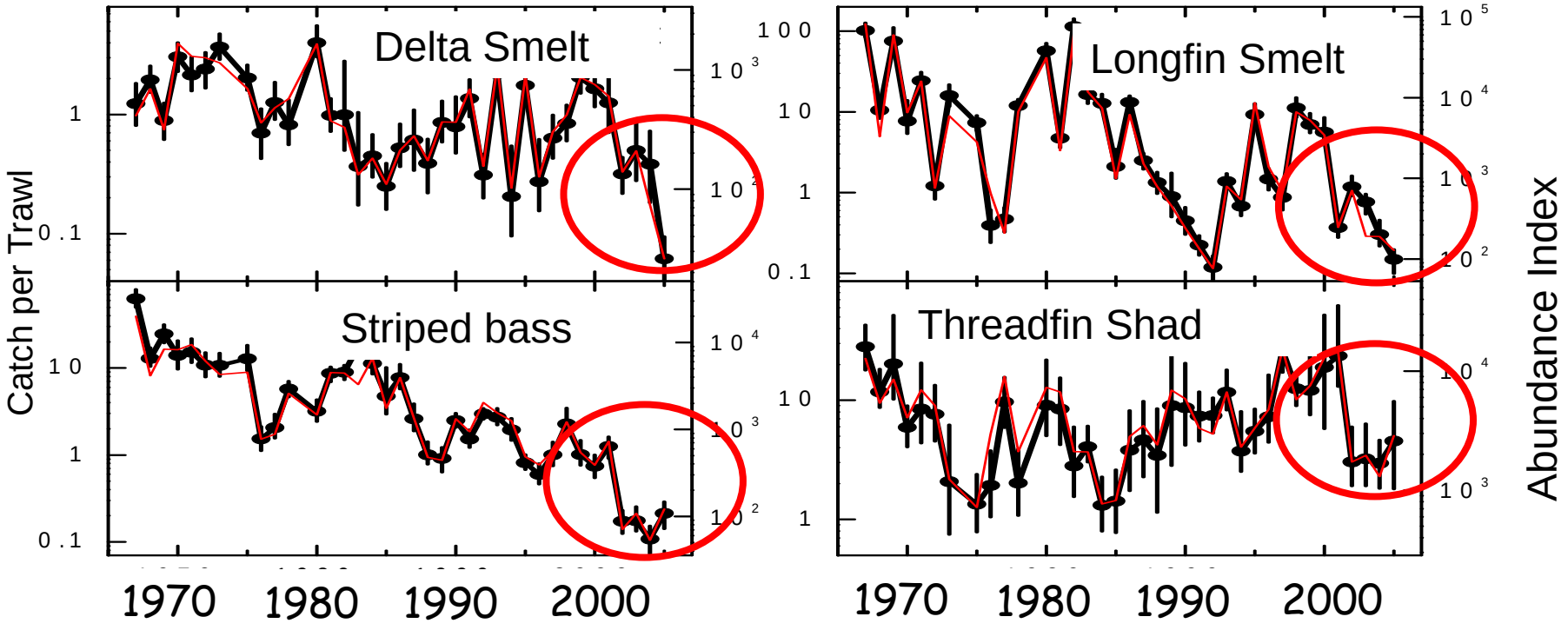
Delta smelt

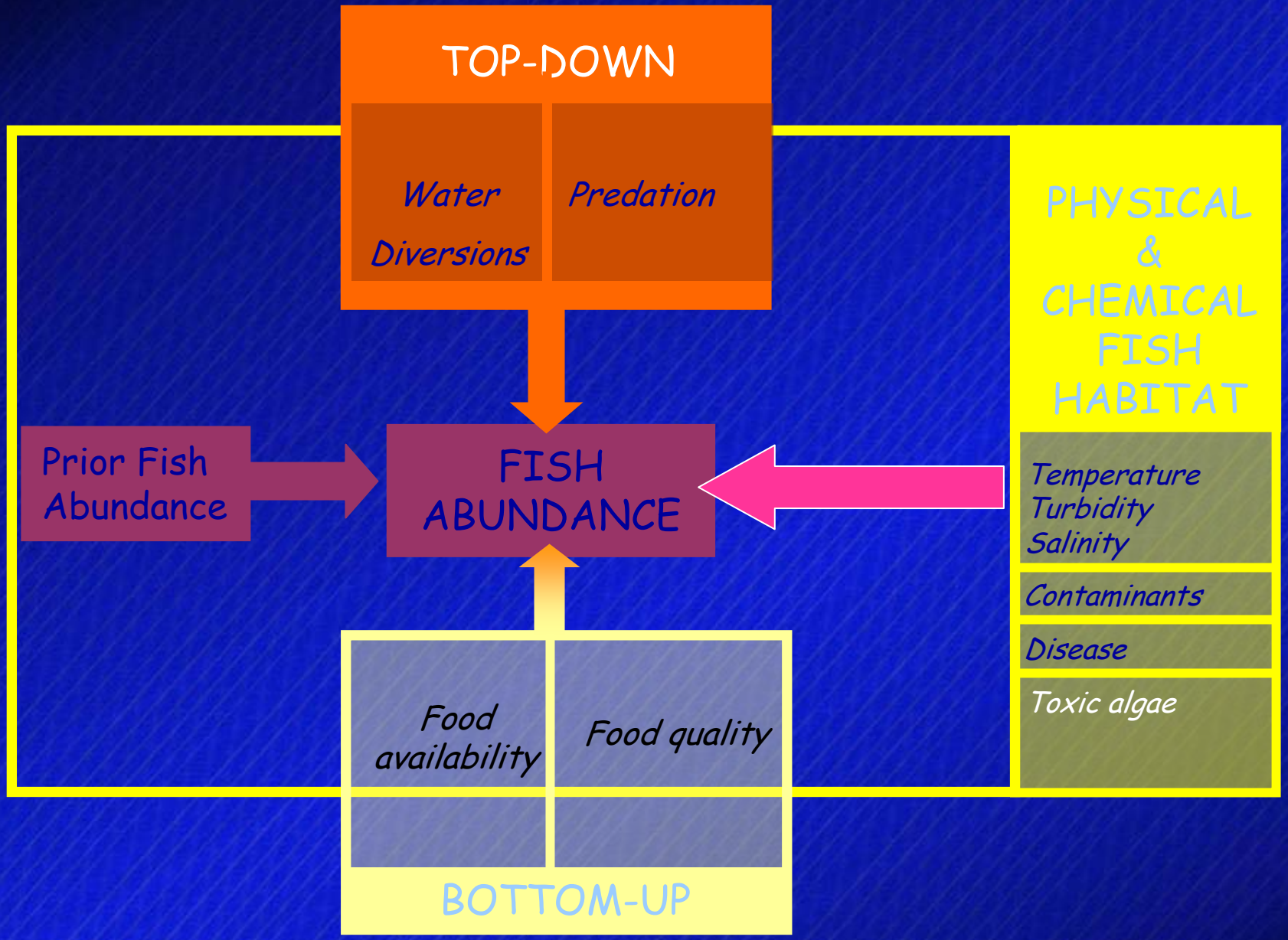
Longfin smelt

Threadfin shad

Striped bass

The Pelagic Organism Decline

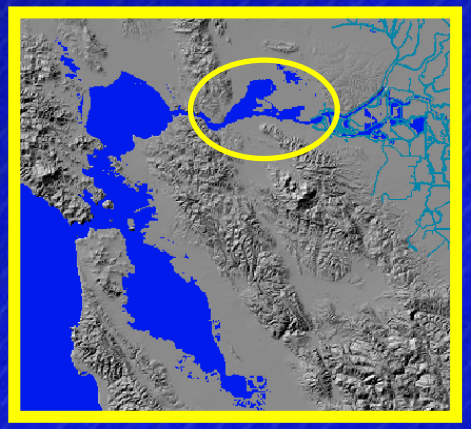


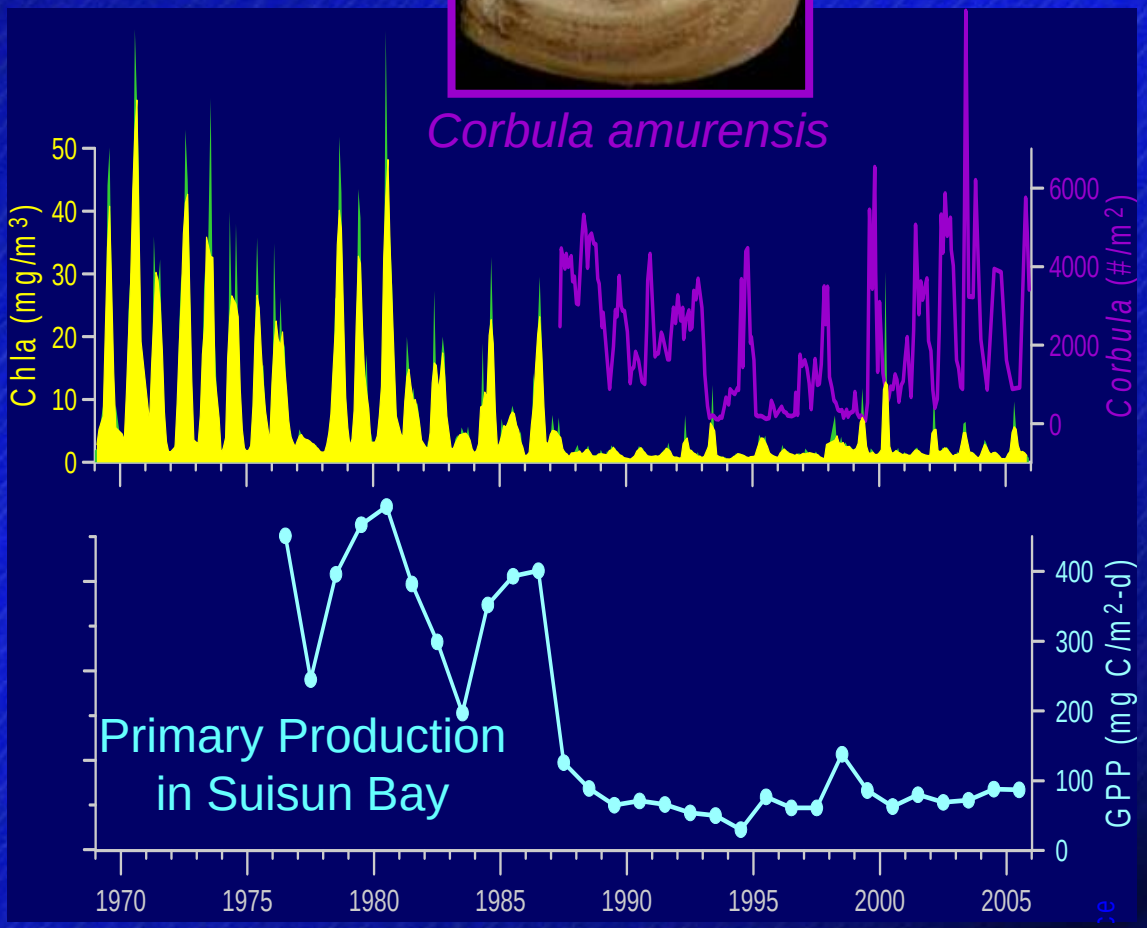

TOP-DOWN
Water Diversions
Predation
PHYSICAL & CHEMICAL FISH HABITAT
Temperature
Turbidity
Salinity
Contaminants
Disease
Toxic algae
Prior Fish Abundance
FISH ABUNDANCE
Food availability
Food quality
BOTTOM-UP

Invasive species

Phytoplankton Primary Production

… CRASHED in Suisun Bay right after the 1987 *Corbula* invasion

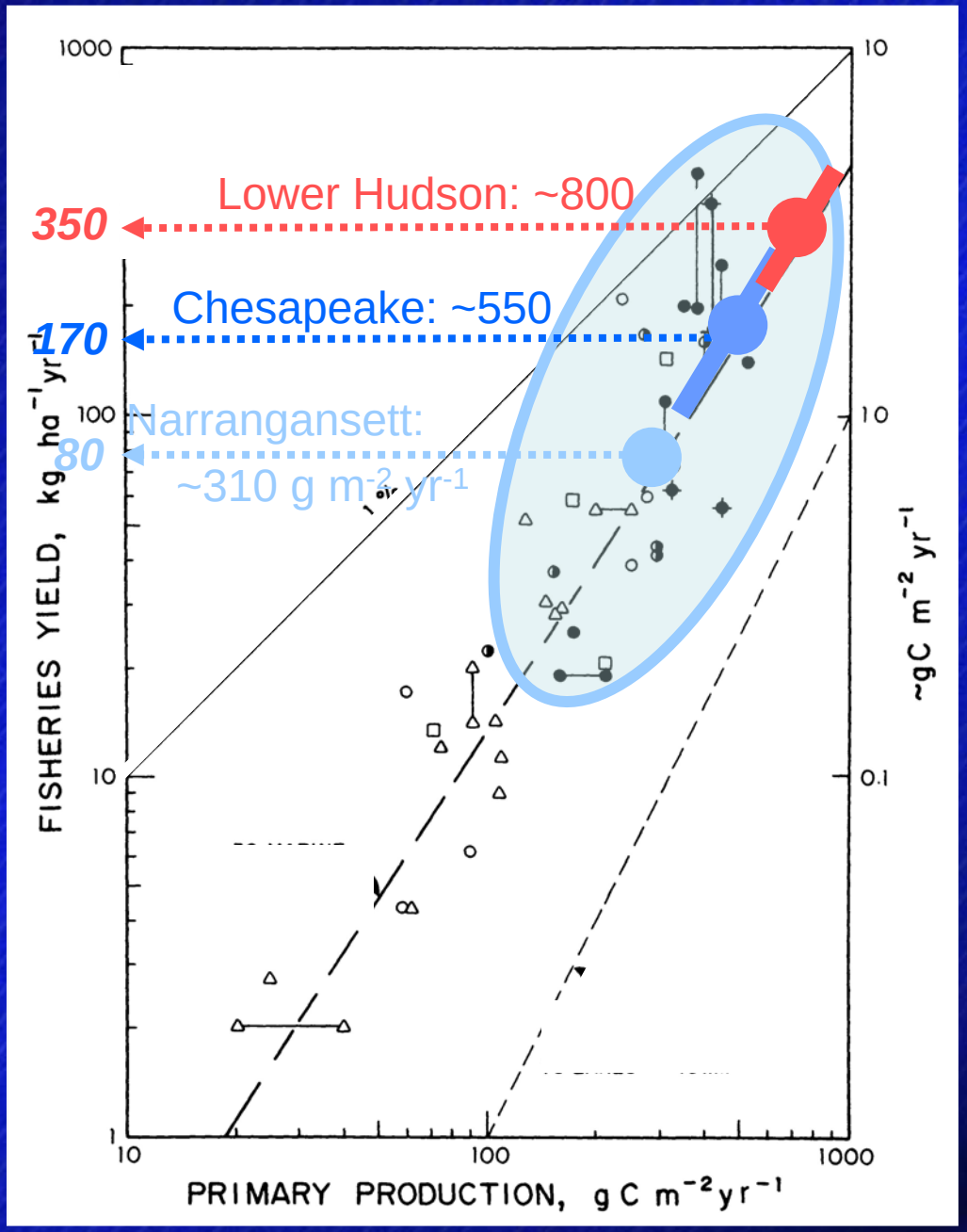




Source: J. Cloern (USGS): Oral presentation at the 2007 Annual IEP Workshop, Asilomar, CA

Phytoplankton Primary Production

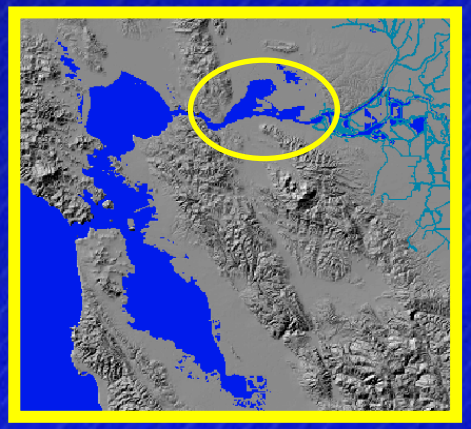
… in Estuaries is typically very HIGH

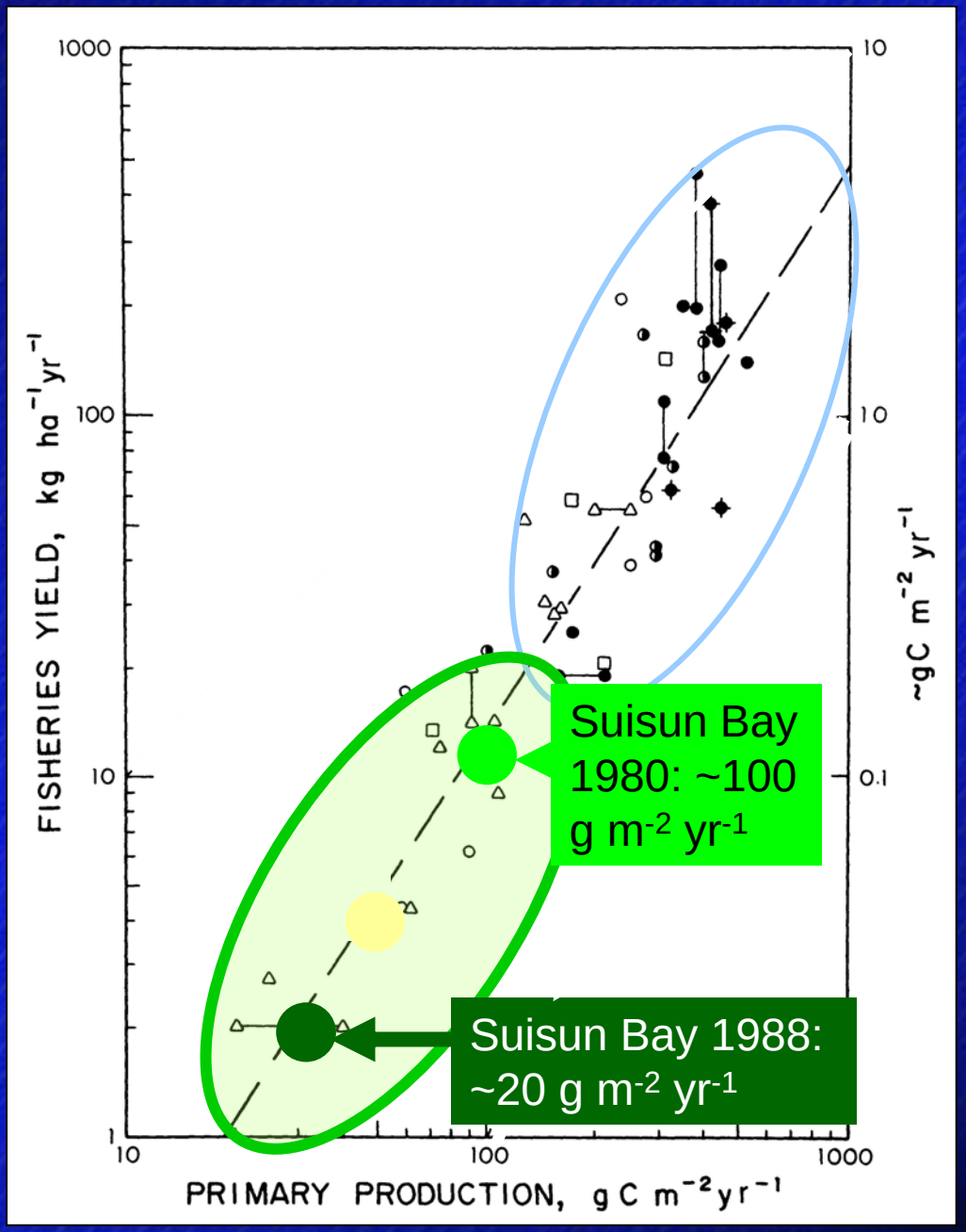


Source: S. Nixon, Limnology and Oceanography 1988

Phytoplankton Primary Production

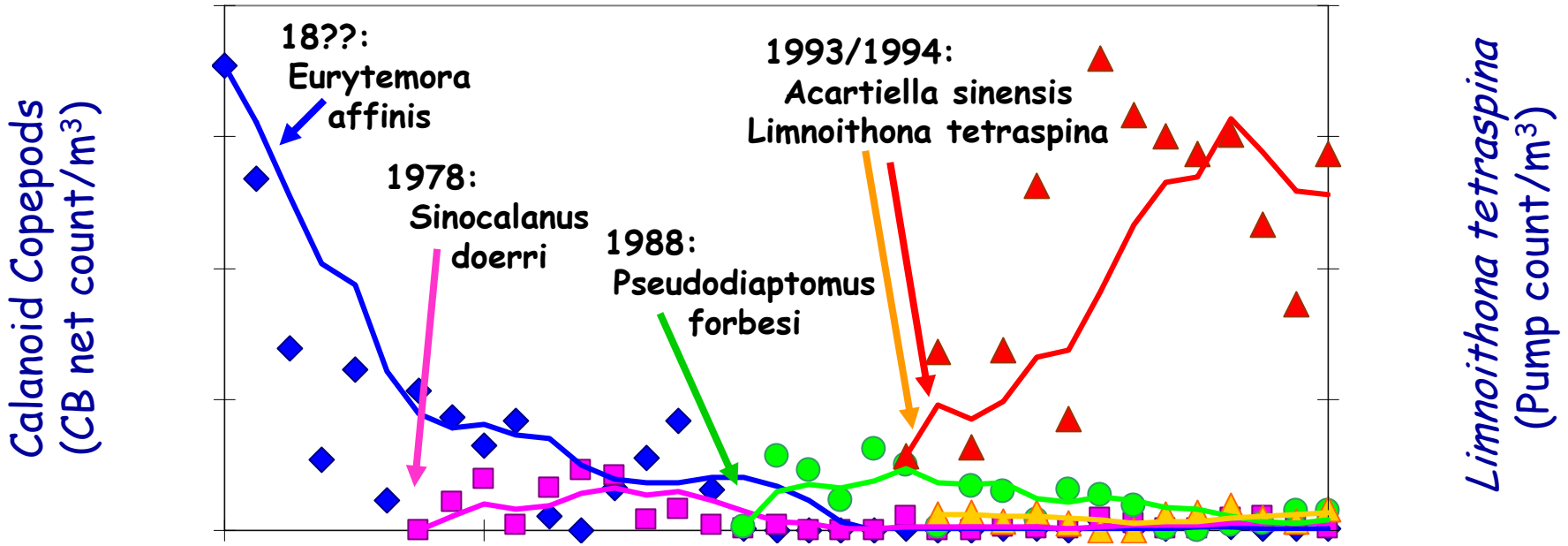
… CRASHED in Suisun Bay right after the Corbula invasion





Sources: J. Cloern (USGS) & A. Jassby (UCD): Oral presentations at the 2007 Annual IEP Workshop, Asilomar, CA

Zooplankton Species Invade in "Waves"

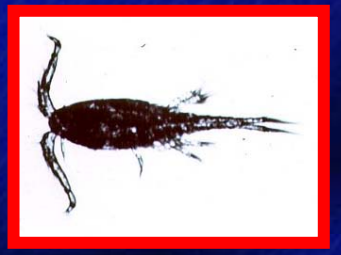


Adult copepods at Chipps Island, yearly average densities with 5-year moving average lines

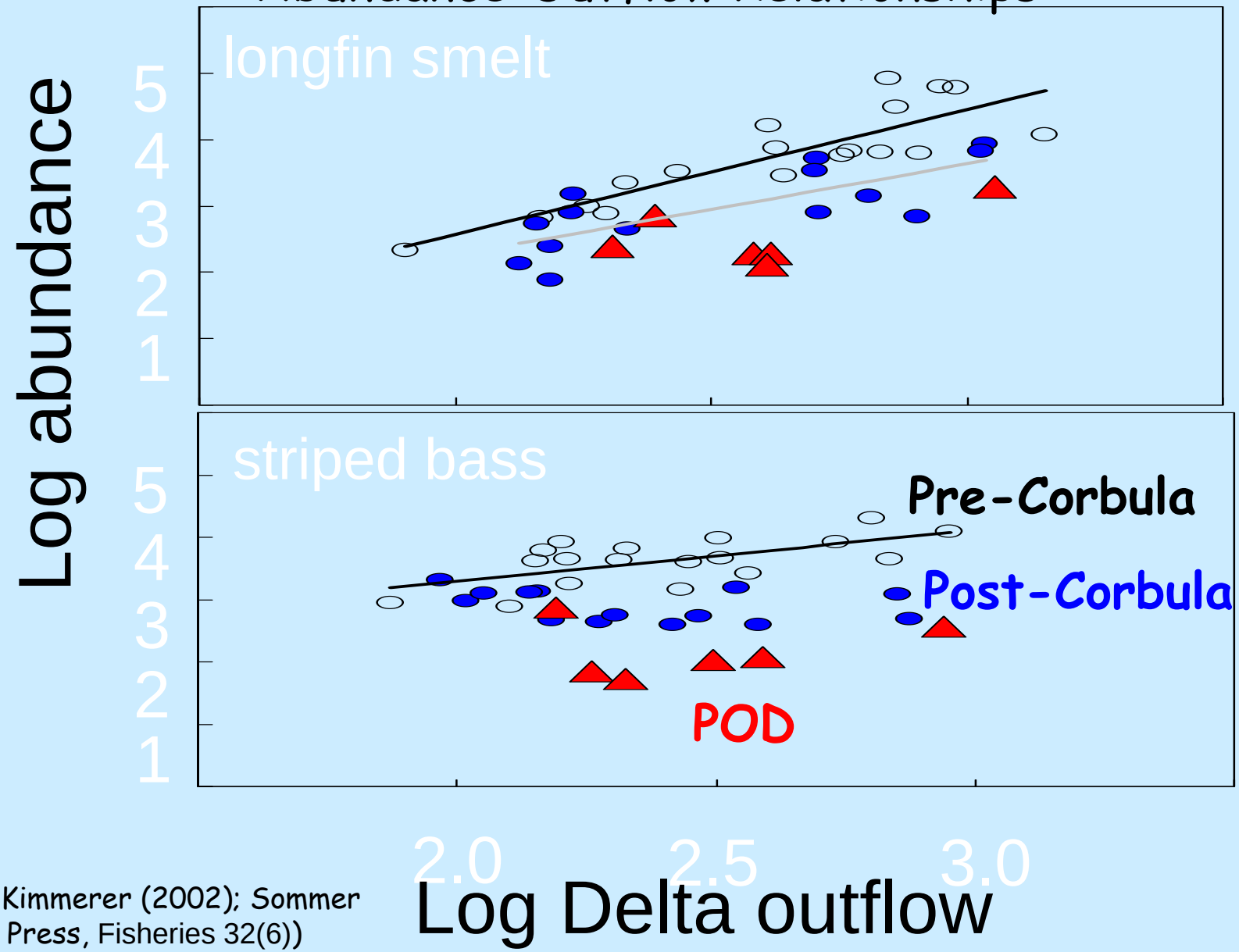
Source: A. Mueller-Solger, DWR; IEP data







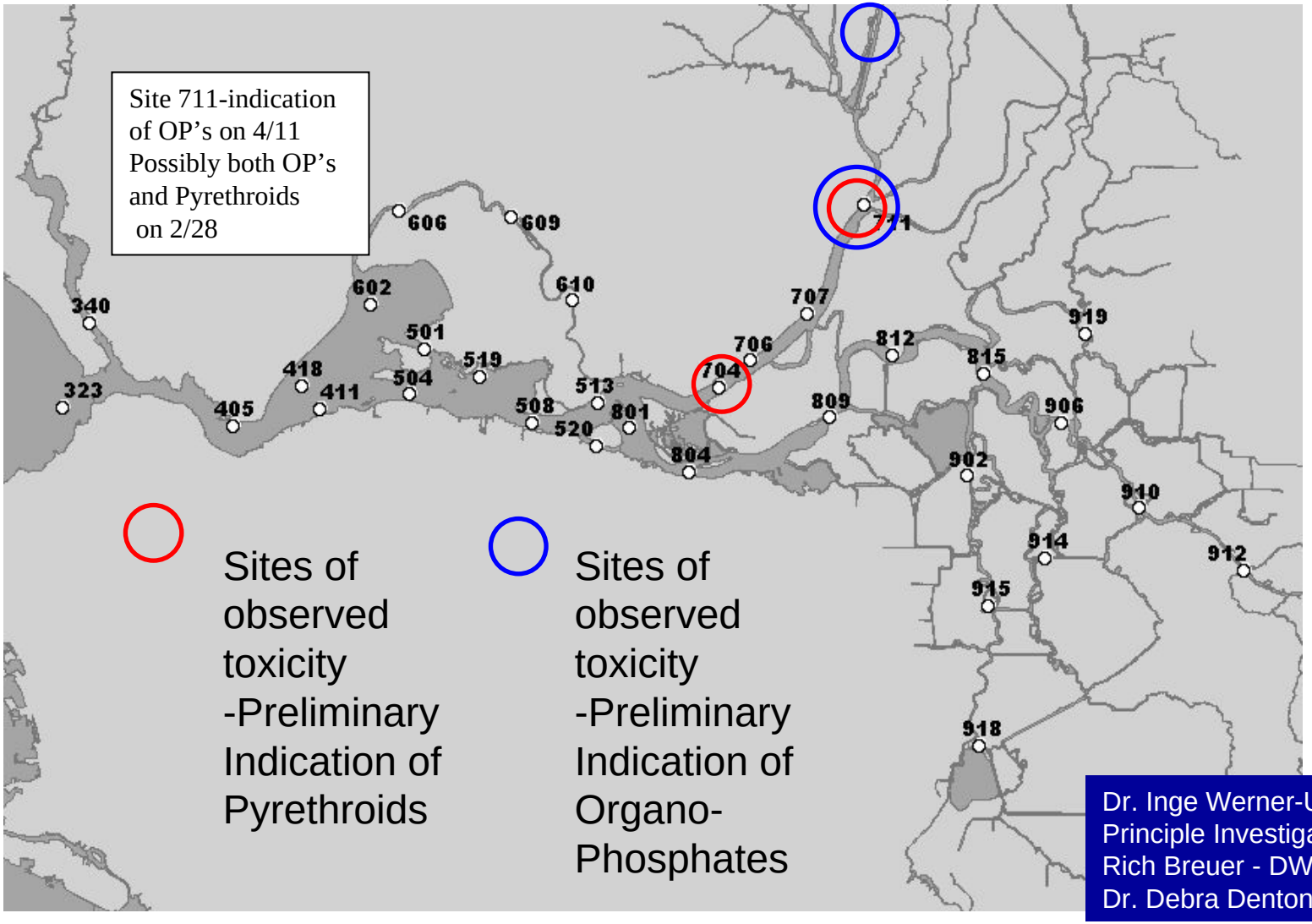
POD Has Further Shifted Abundance-Outflow Relationships



Source: Kimmerer (2002); Sommer et al. (In Press, Fisheries 32(6))

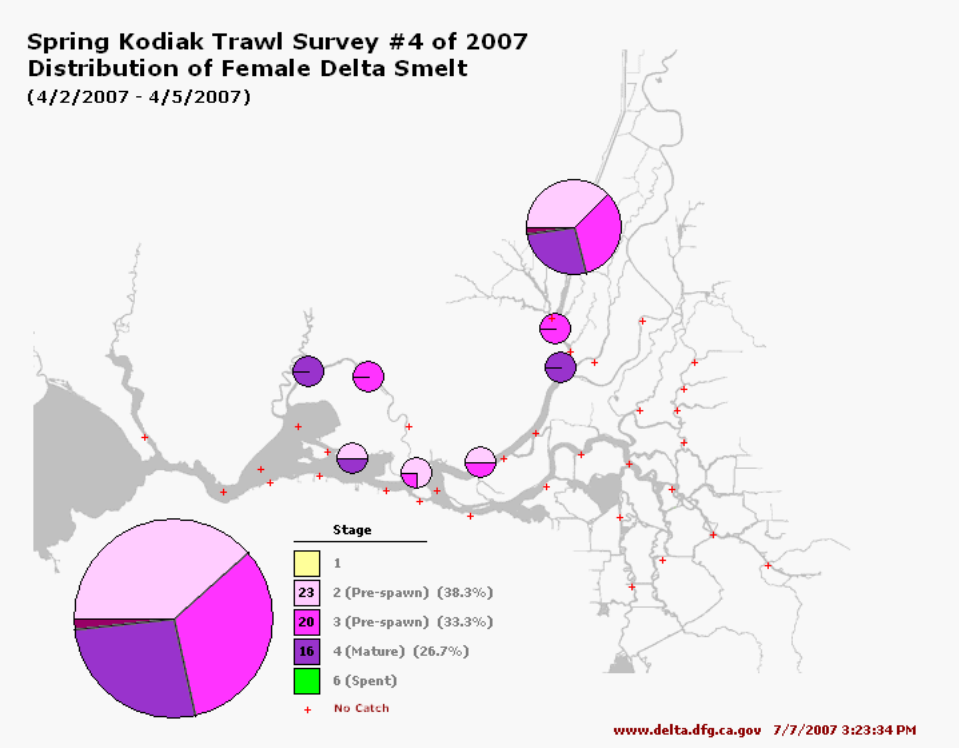
Toxics

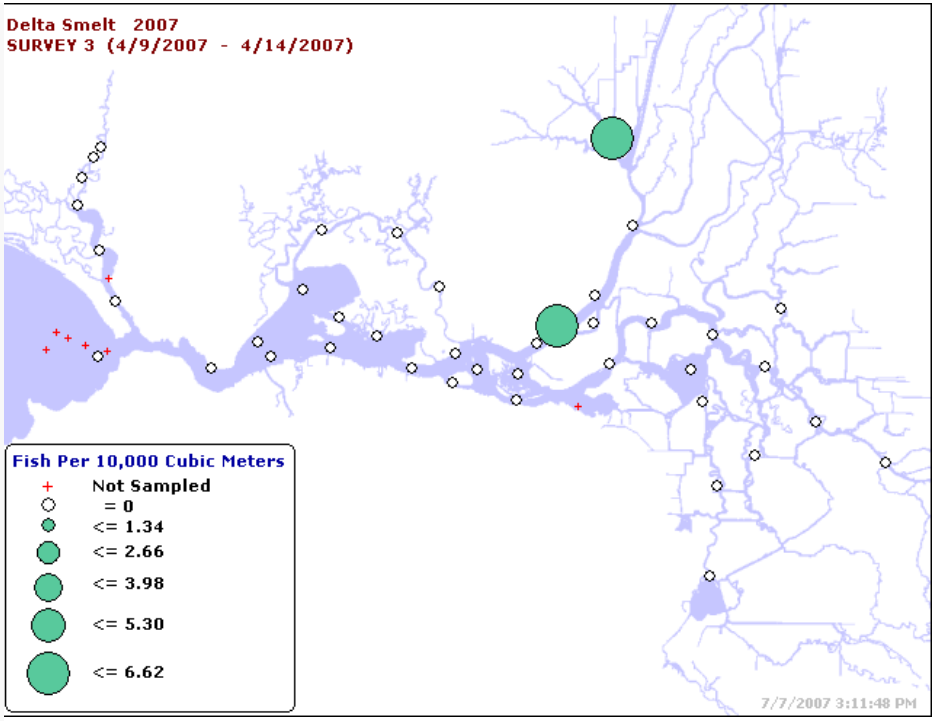
Synopsis of Toxicity Test Findings
Four Dates Feb through April 2007



Dr. Inge Werner-UCD-
Principle Investigator
Rich Breuer - DWR
Dr. Debra Denton-USEPA

Distribution of Adult and Young Smelt in April 2007 In areas with Toxicity Events



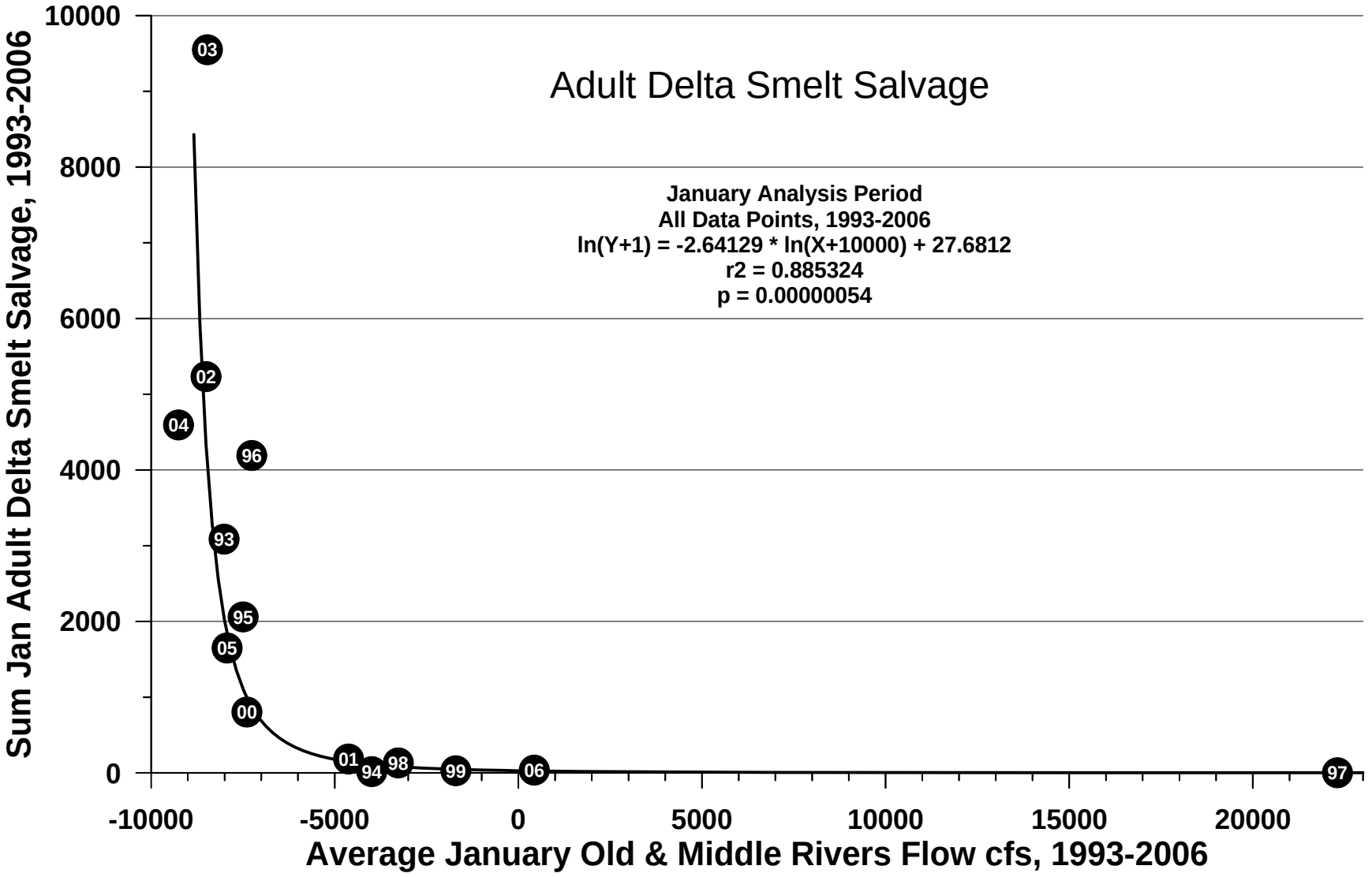


2007 Early Adult Delta Smelt abundance a little higher than 2006

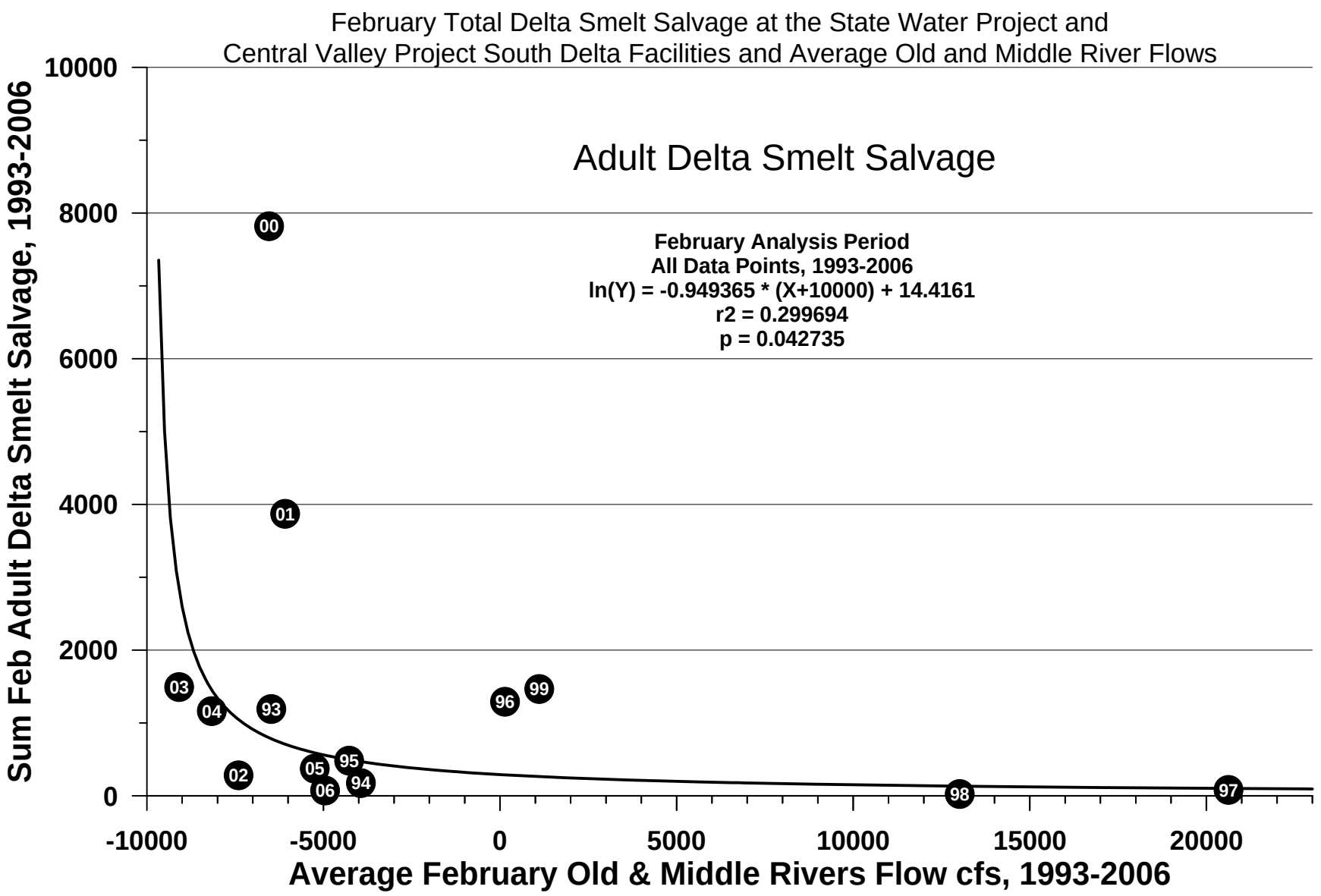
2007 Juvenile abundance about 1/10 of 2006 -- Toxicity ?

Water Project Operations

January Total Delta Smelt Salvage at the State Water Project and
Central Valley Project South Delta Facilities and Average Old and Middle River Flows



Notes: Negative numbers indicate net upstream flow.
Prepared by DWR adapted from analysis performed by USGS.



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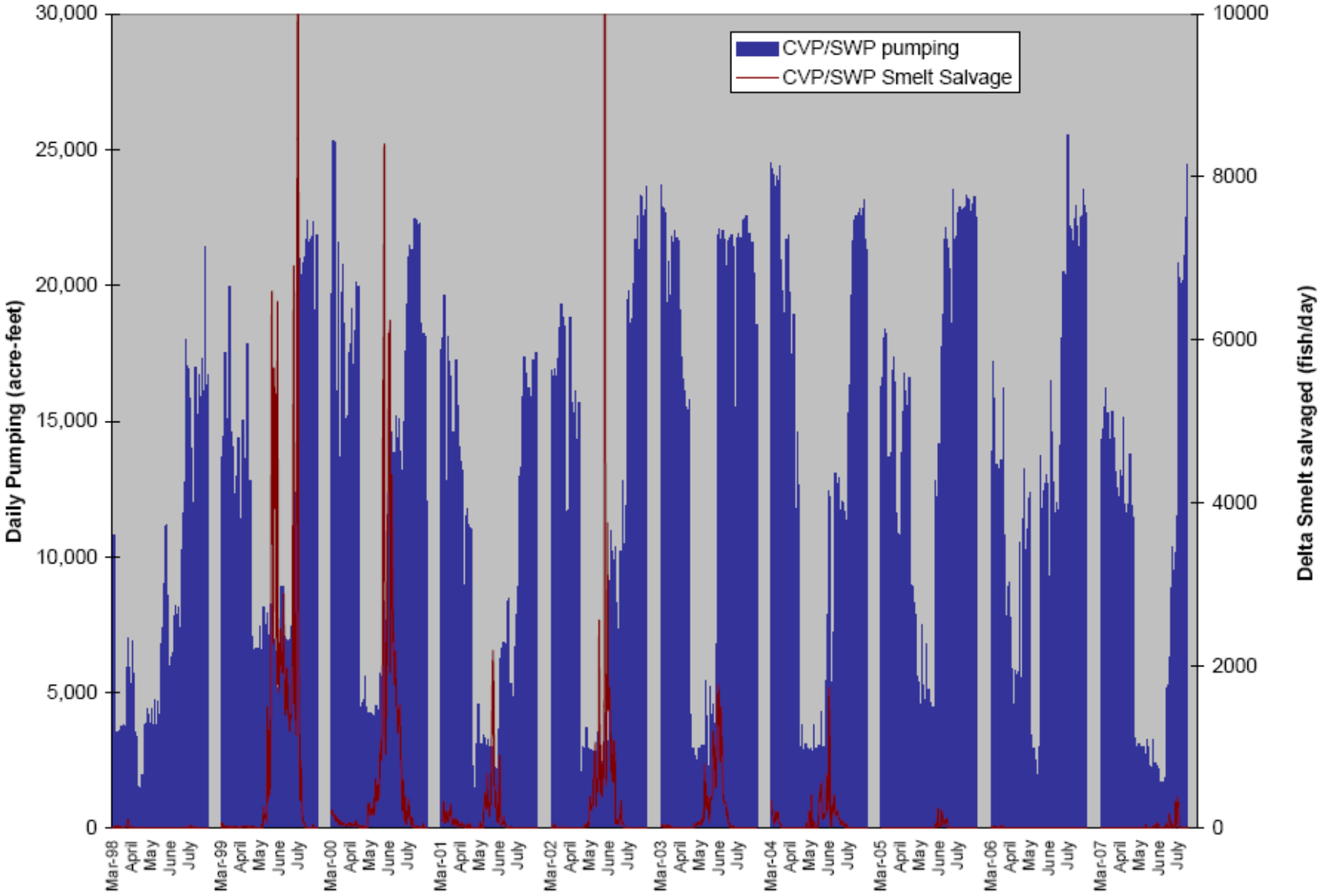
Juvenile Delta Smelt Salvage



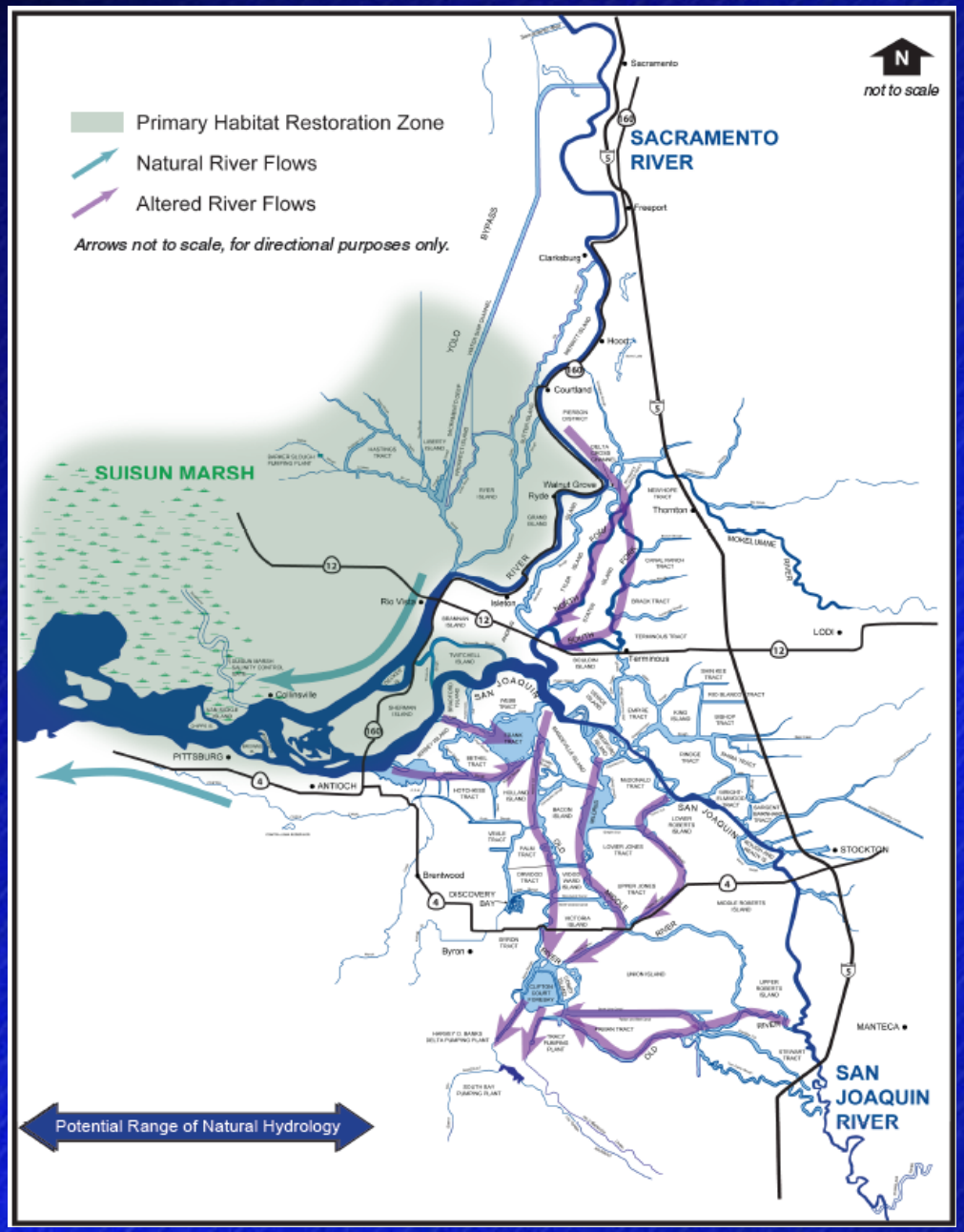
The Bay/Delta System

- Biologically Complex
- Changing
  - Invasive species - Prevent, adapt and create new habitat opportunities
  - Toxics - Address aggressively at source
  - Water Project - Location of operations

- Need a Holistic Approach
- Bay/Delta Conservation Plan (BDCP)

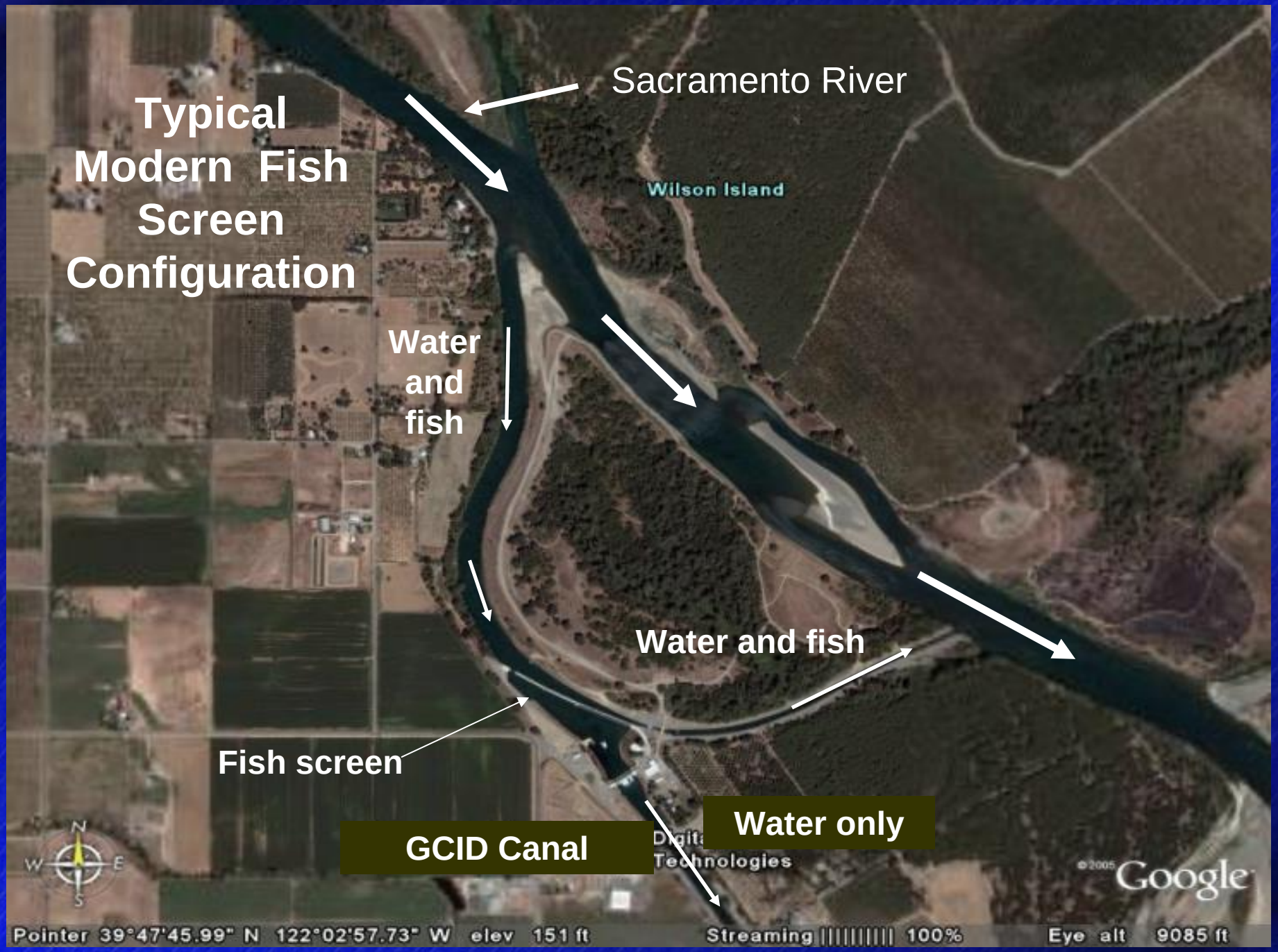
What's the Purpose of the BDCP?

- Provides a plan to restore and protect water supply, water quality, and ecosystem health within a stable regulatory framework.
- FESA/CESA Compliance
- Long-term Incidental Take Permits for water project operations
- Assurance that future ESA listings will not result in additional environmental regulation and mitigation.



Existing Water Conveyance Through the Delta

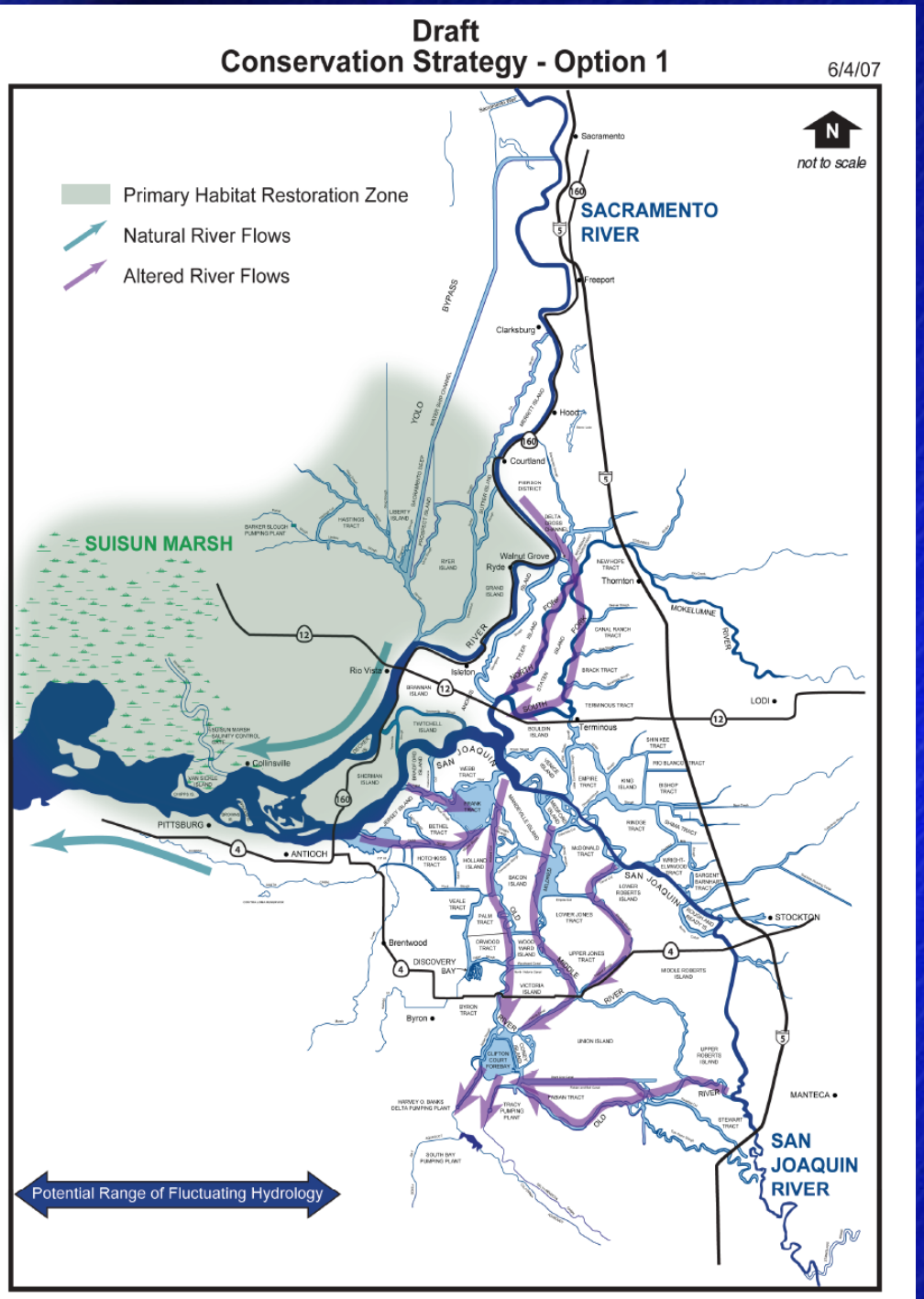
- Flows shown are net flows
- Tidal Estuary
- SWP and CVP Fish screens a bottom of the system


Typical Modern Fish Screen Configuration
Sacramento River
Wilson Island
Water and fish
Water and fish
Fish screen
GCID Canal
Water only
Digital Technologies
©2005 Google
Pointer 39°47'45.99" N 122°02'57.73" W elev 151 ft
Streaming 100%
Eye alt 9085 ft

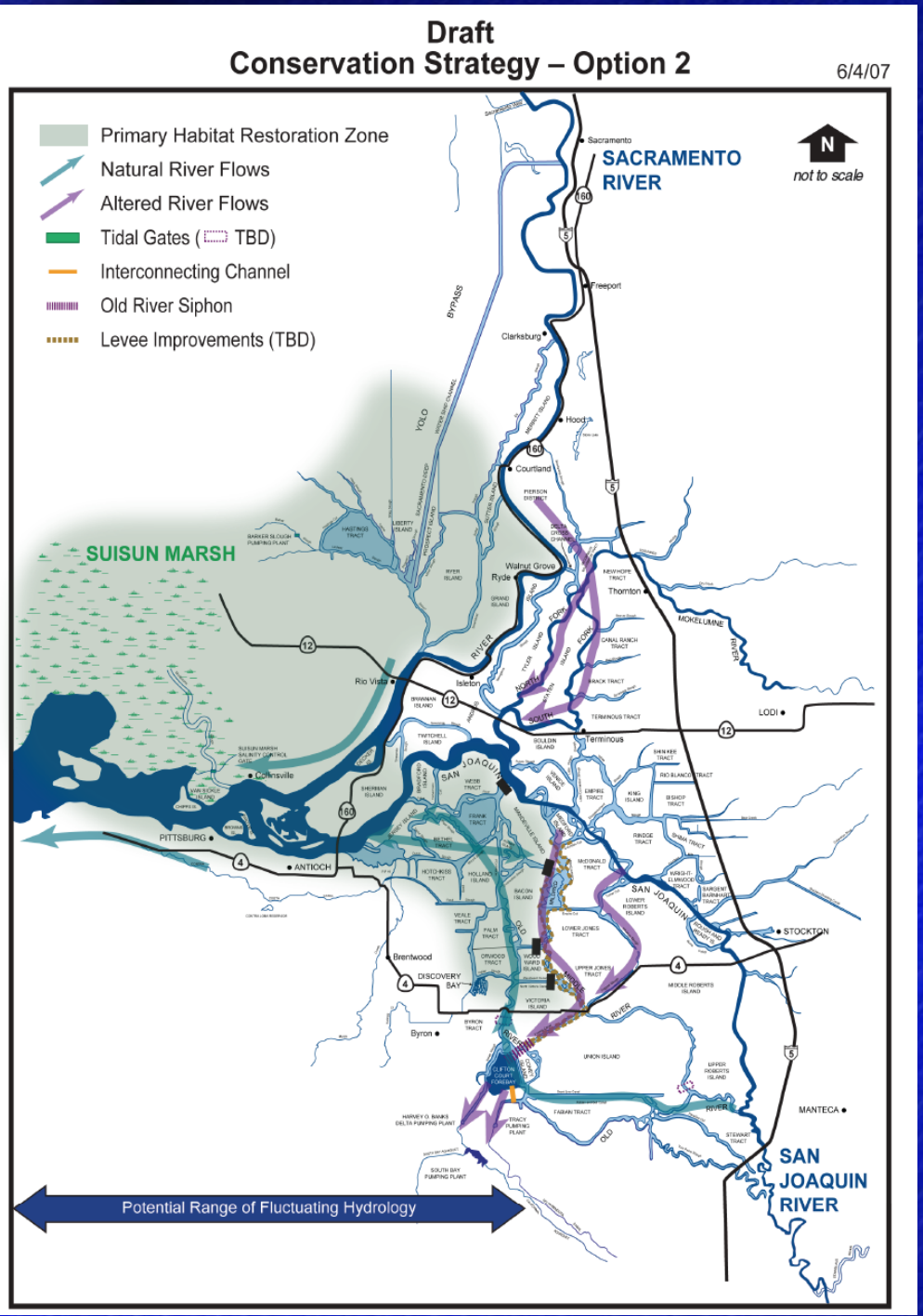
Early Question

- What is the one conservation measure that can improve Delta fisheries in the future?

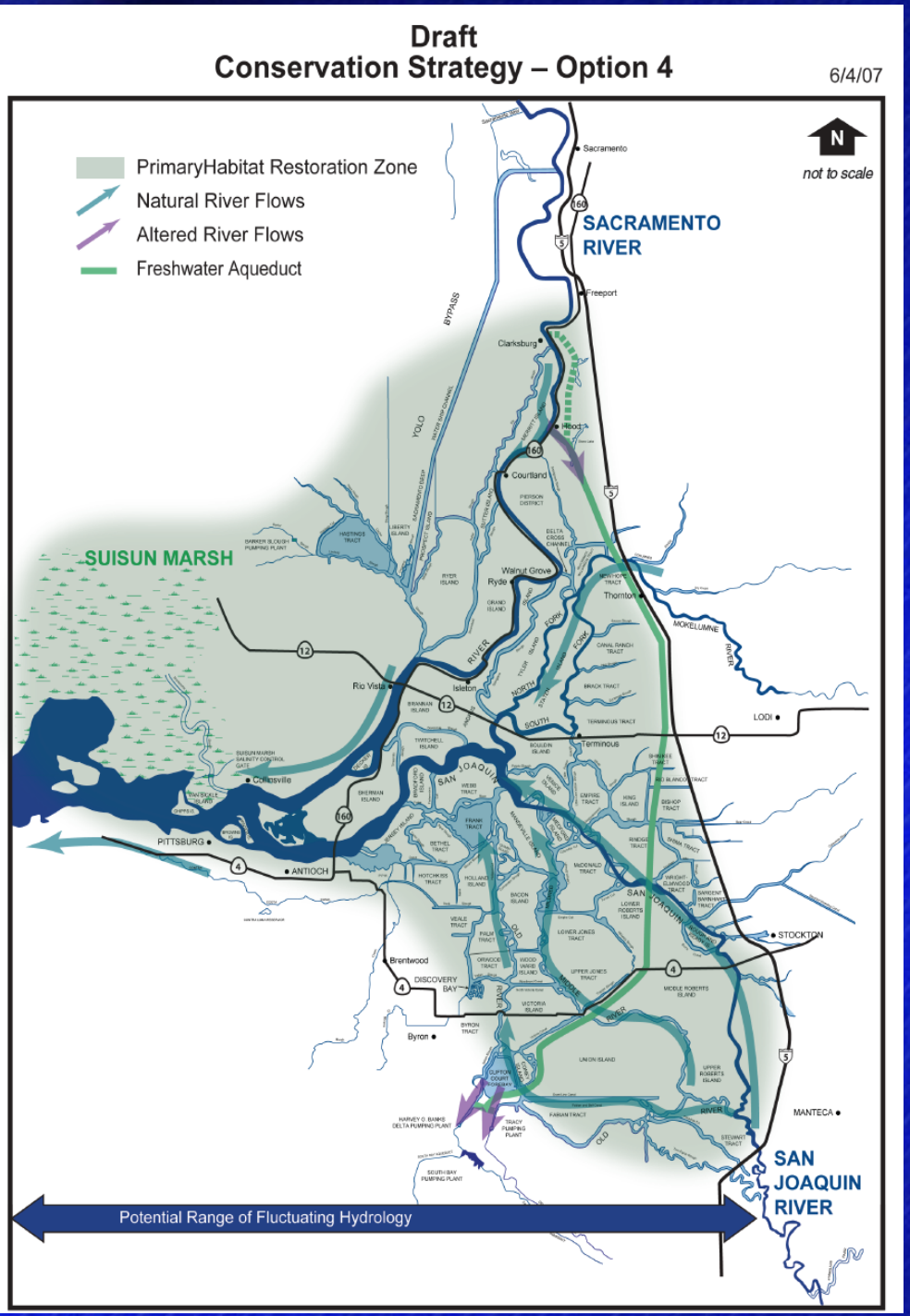
- "Change in Delta Water Conveyance Systems"
  - Current System Concept Developed in 1920's
  - Designed with 1950-60's Technology and Science
  - Location of facilities - not so much the operation
    - Flow alteration in the Delta
    - Fish Salvage facilities
  - Separate the fish from the water early
  - Open up more areas for native fish habitat and food productivity development



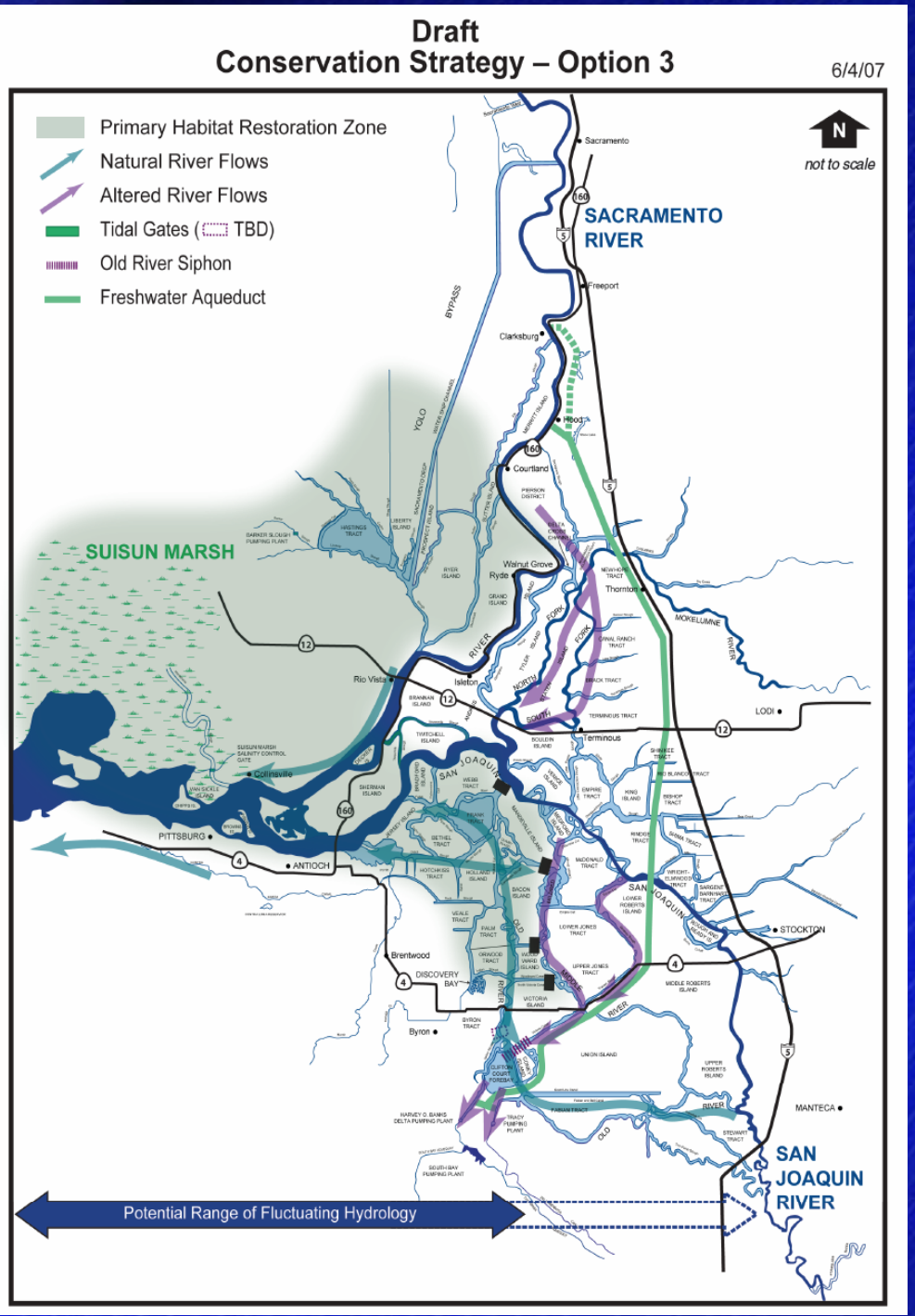
- Similar to PPIC Alternative 7 "Opportunistic Delta"
- Uses existing conveyance and pump facilities
- Operations focused on reducing take at the export facilities and improved hydrologic conditions for fish in the northern and western Delta
- Habitat restoration in northern and western Delta and Suisun Marsh



- Similar to PPIC Alternative # 6 "Armored-Island Aqueduct"
- Improvement of through-Delta conveyance by the constructing operable barriers and levee improvements along Middle River
- Separating water supply conveyance flows from SJR flows with a siphon connecting Victoria Canal and CCF
- Operations focused on reducing take at the export facilities and improvement of hydrologic conditions for fish in the northern, western, central, and southern Delta
- Habitat restoration in the northern, western, central, and southern Delta and Suisun Marsh



- Similar to PPIC Alternative # 4
- "Isolated Conveyance"
- Isolated aqueduct with state-of-the-art positive barrier fish screen near Hood or Clarksburg.
- Flexibility to improve hydrologic conditions for covered fish species throughout the Delta and to physically restore and enhance habitat opportunistically throughout the Delta and Suisun Marsh.



- Similar to PPIC Alternatives # 4 and 6, "Armored-Island Aqueduct" and "Peripheral Canal Plus"
- Dual conveyance facilities – isolated aqueduct with state-of-the-art positive barrier fish screen near Hood or Clarksburg and improved through Delta conveyance as in BDCP Option 2.
- Flexibility of dual-conveyance enables reduction in take at the export facilities and improved hydrologic conditions for fish in the northern, western, central, and southern Delta.
- Habitat restoration in the northern, western, central, and southern Delta and the Suisun Marsh

What's Next?

Impact Analysis of the four CSO's
(July-August 2007)

Public Outreach & Public Scoping

Draft Framework Conservation Strategy
(October 2007)

BDCP Independent Science Input

Final Framework Conservation Strategy
(December 2007)

Questions?